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IS 16052-3 (2013): Refractory Mortars, Part 3: Determination of Joint Stability [MTD 15: Refractories]

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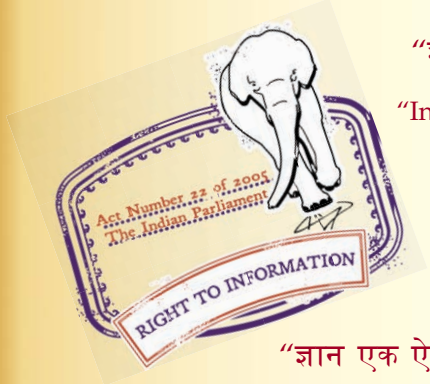

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IS 16052 (Part 3) : 2013
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अग्निसह मोर्टार्स

भाग 3 जोड़ की स्थिरता ज्ञात करना

Indian Standard

REFRACTORY MORTARS

PART 3 DETERMINATION OF JOINT STABILITY

ICS 81.080

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

February 2013 **Price Group 2**

Refractories Sectional Committee, MTD 15

NATIONAL FOREWORD

This Indian Standard (Part 3) which is identical with ISO 13765-3 : 2004 'Refractory mortars — Part 3: Determination of joint stability' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Refractories Sectional Committee and approval of the Metallurgical Engineering Division Council.

This standard is published in various parts. Other parts in this series are:

Part 1 Determination of consistency using the penetrating cone method
Part 2 Determination of consistency using the reciprocating flow table method
Part 4 Determination of flexural bonding strength
Part 5 Determination of grain size distribution (sieve analysis)
Part 6 Determination of moisture content of ready-mixed mortars

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their respective places are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 8656-1 Refractory products — Sampling of raw materials and unshaped products — Part 1: Sampling scheme	IS 1528 (Part 7) : 2011 Methods of sampling and physical tests for refractory materials: Part 7 Methods of sampling and criteria for conformity *(second revision)*	Technically Equivalent
ISO 13765-1 : 2004 Refractory mortars — Part 1: Determination of consistency using the penetrating cone method	IS 16052 (Part 1) : 2013 Refractory mortars: Part 1 Determination of consistency using the penetrating cone method	Identical
ISO 13765-2 : 2004 Refractory mortars — Part 2: Determination of consistency using the reciprocating flow table method	IS 16052 (Part 2) : 2013 Refractory mortars: Part 2 Determination of consistency using the reciprocating flow table method	do

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
REFRACTORY MORTARS
PART 3 DETERMINATION OF JOINT STABILITY

1 Scope

This part of ISO 13765 describes a method of determination of joint stability of refractory mortars.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8656-1, *Refractory products — Sampling of raw materials and unshaped products — Part 1: Sampling scheme*

ISO 13765-1, *Refractory mortars — Part 1: Determination of consistency using the penetrating cone method*

ISO 13765-2, *Refractory mortars — Part 2: Determination of consistency using the reciprocating flow table method*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
joint stability
stability of the mortar joint between bricks when moving by hand one brick jointed to another without breaking the joint

NOTE The time over which this operation is possible before the mortar becomes dry due to loss of specified mixing liquid is used as the time of joint stability.

4 Principle

Trials are carried out laying refractory bricks with a mortar to determine the time of joint stability of the refractory mortar.

5 Apparatus

5.1 **Mixer**, as specified in ISO 13765-1 or ISO 13765-2.

5.2 **Electrical drying oven**, fitted with a temperature controller and capable of operating at 110 °C ± 5 °C.

5.3 **Consistency determining device**, as specified in ISO 13765-1 or ISO 13765-2.

5.4 **Balance**, with a weighing capacity of 10 kg and capable of weighing to the nearest 1 g.

5.5 Stopwatch.

5.6 Spacing rods, made of clean metal (e.g. stainless steel) and with a diameter of 3 mm ± 0,1 mm.

5.7 Measuring cylinder.

6 Sampling

For dry mortar, sample the mortar in accordance with ISO 8656-1 or as agreed between parties. Reduce the sample to 5 kg by quartering or with a riffle sampler.

Sample ready-mixed mortars by emptying the entire contents of the container in which the mortar is supplied into another container of larger capacity and mixing thoroughly. It is important that any supernatant liquid not be discarded. Ensure that a representative sample of the wet mixture is obtained.

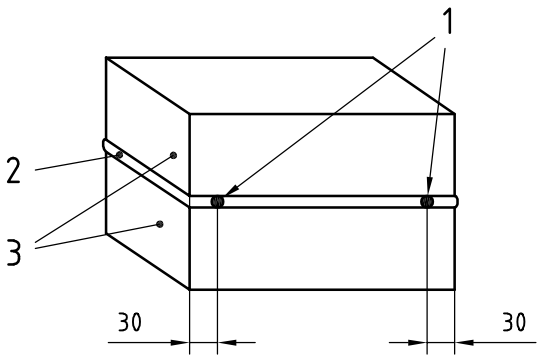
7 Procedure

7.1 Place four standard bricks, 230 mm × 114 mm × 76 mm, with smooth surfaces and clean edges (remove any dust with a hard brush) in the drying oven and dry for at least 24 h, then cool to room temperature naturally. The bricks used in the test shall be compatible with the mortar to be tested.

7.2 For dry mortars, place the mortar in the mixer and add water (or a specified mixing liquid) to the sample and mix thoroughly to attain the desired consistency. Allow the mixed mortar to stand for 30 min or in accordance with the manufacturer's instructions. Ready-mixed mortars shall be tested in the “as-received” state. Note the consistency in accordance with ISO 13765-1 or ISO 13765-2.

7.3 Apply the well-mixed mortar to the 230 mm × 114 mm face of the dried refractory brick. The longitudinal faces of each brick shall be parallel to each other within a tolerance of ± 1 mm and the sides of a cross-section of the brick shall be parallel to each other within a tolerance of 0,5 mm. Position two spacing rods in the mortar layer parallel to and 30 mm from the 114-mm edges. Place another brick on top as shown in Figure 1.

Dimensions in millimetres



Key

1 metal rod
2 mortar
3 brick

Figure 1 — Placement of bricks

7.4 Press lightly on the top brick while moving it in a to-and-fro motion along the 230-mm direction until a joint of 3 mm is achieved.

7.5 Withdraw the spacing rods, avoiding disruption of the joint and remove the excess mortar from the edges of the joint. Start the stopwatch and move the top brick back and forth in the 230-mm direction without breaking the joint. When the brick can no longer be moved in this way, stop the stopwatch and record the time elapsed in seconds.

7.6 Repeat the operation from 7.3 to 7.5 for the second pair of bricks.

8 Expression of results

Report the joint stability of the mortar as the mean of the two measurements, in seconds.

9 Test report

The report shall include the following information:

a) all information necessary for identification of the material tested, including a description of the material, manufacturer, type, brand, batch number, etc.;

b) a reference to this part of ISO 13765 (ISO 13765-3);

c) the name of the testing establishment;

d) the type, brand and manufacturer of the refractory bricks used in the test;

e) in the case of a dry mortar, the percentage of water (or specified liquid) added;

f) the results of the test, i.e. the joint stability time in seconds, including the results of the individual determinations and their mean, calculated as specified in Clause 8;

g) the consistency of the mortar tested and the method used to determine the consistency, i.e. ISO 13765-1 or ISO 13765-2;

h) the ambient temperature at which the test was conducted;

i) any deviations from the procedure specified;

j) any unusual features (anomalies) observed during the test;

k) the date of the test.

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Amendments Issued Since Publication

Amendment No.	Date of Issue	Text Affected

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